

Revised 09/04

CORRES. CONTROL  
INCOMING LTR NO.

00429 RF04

DUE DATE

ACTION



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 8

999 18<sup>TH</sup> STREET- SUITE 300

DENVER, CO 80202-2466

Phone 800-227-8917

http://www.epa.gov/region08

SEP 23 2004

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2004 SEP 27 A 11:35

CORRESPONDENCE  
CONTROL

DIST.	LTR	ENC
BERARDINI, J.H.	X	X
BOGNAR, E.S.	X	X
BROOKS, L.	X	X
BUTLER, L.	X	X
CARPENTER, M.	X	X
CIUCCI, J.A.		
CROCKETT, G.A.		
DECK, C. A.	X	X
DEGENHART, K. R.		
DIETER, T. J.		
FERRERA, D. W.	X	X
GIACOMINI, J. J.		
LINDSAY, D. C.		
LONG, J. W.		
LYLE, J. L.		
MARTINEZ, L. A.	X	X
NAGEL, R. E.	X	X
NESTA, S.		
NORTH, K.	X	X
SHELTON, D. C.	X	X
SPEARS, M. S.		
PIZZUTO, V.M.		
TUOR, N. R.		
WEMELT, K.	X	X
WILLIAMS, J. L.		
ZAHM, C.	X	X
Rosenman	X	X

Ref: EPR-F

Mr. Joe Legare

Assistant Administrator for Environment and Stewardship

US Department of Energy-RFFO

10808 Highway 93, Unit A

Golden CO 80403-8200

RE: RFETS Present Landfill 95% design

Dear Mr. Legare:

This is in response to your letter of August 27, 2004 requesting approval of the present landfill 95% design, revision 2 of the drawing and specifications, and revision 1 of the calculations. These documents were received by EPA on several dates in the last half of August.

EPA has agreed that implementation may take place in two phases at the Present Landfill, beginning on the western part of the landfill. Since the signature of the IM/IRA, we have received maps locating the east-west delineation line and the locations of the geotechnical boreholes. West side work and east side construction activities related to the geotechnical samples and pond clearing (sections one and two of attachment 2 of your letter) are approved; however, the final soil cover may only be installed once an updated specification is provided. The specification should describe materials to be used and ensure they meet engineering and agricultural specifications suitable to provide for the erosion and revegetation objectives of the landfill cover. These activities are approved with the expectation that the following elements will be included in the final design documents:

- the east-west line delineation line on one of the design drawings, and the description from your letter of what took place during Phase I and what is scheduled for Phase II
- details of the geotechnical sampling event, and
- adequate description and drawing detail of the plans for the ground water interception pipeline system.

An approved design document will be needed prior to beginning remaining work east of the line. An approvable document will also need the following:

COR. CONTROL	X	X
ADMIN. RECORD	X	X
PATS/130		

Reviewed for Addressee  
Corres. Control RFP

9/27/04  
Date By

Ref. Ltr. #

DOE ORDER #

500-1

ADMIN RECORD

OU07-A-000555

- updated design specifications and drawings for the east face based on analysis of actual geotechnical samples,
- a revised Appendix G reflecting the agreement to use SHAKE as agreed on August 13, or another appropriate agreed-upon method for stability planning,
- a tie-in plan between the east and the west landfill work
- an updated vegetative specification identifying vegetative performance goals consistent with section 5.1 of the IM/IRA,
- details of disposal and other activities related to relocation of the pond sediment, and
- the confirmation sampling protocols for contaminants at the pond

Section 5.1 of the IM/IRA specifies surface vegetation will be established "to enhance resistance to surface erosion, prevent intrusion of noxious weeds and burrowing animals, and to provide an aesthetic appearance to the cover, using appropriate native seed mixes." It is also noted that inconsistencies exist and a few issues remain unresolved in this recent submittal. Remaining comments and clarifying detail are attached.

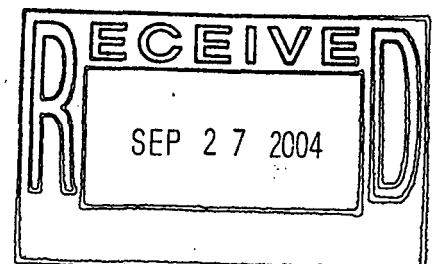
It is my understanding that applicable specifications in the August 2004 design document revision will be met for these interim activities. Grubbed material will not be put back into the landfill. The design document should be approved prior to work on the East Face, the interceptor pipeline system, and the pond sediment.

Sincerely,

*Pat Smith for Mark Aguilar*

C. Mark Aguilar  
Rocky Flats Project Manager

cc: Dave Shelton, K-H  
Steve Gunderson, CDPHE  
Mark Sattelberg, USF&W  
Administrative Record, T130G  
Pat Smith, EPA



**COMMENTS ON THE ACCELERATED ACTION DESIGN  
FOR THE PRESENT LANDFILL FINAL DESIGN AUGUST 2004  
ROCKY FLAT ENVIRONMENTAL TECHNOLOGY SITE  
GOLDEN, COLORADO**

**GENERAL COMMENTS**

1. Previous discussions indicate that the project will be implemented in two phases. Phase 1 will include the west portion of the landfill. Phase 2 will include the east portion of the landfill. The design documents should identify the location of the boundary separating the 2 phases and the scope of each phase. Because significant design and documentation still must be provided for Phase 2, the documents should identify the boundary and scope of Phase 1 of the project. It would then be feasible to approve Phase 1 while the design of Phase 2 is in progress.

Also, in accordance with your letter to us, the final design document should provide a detailed description of the tasks to be implemented to complete Phase 2.

2. The documents provide no specific plans and specifications for the disposition of the groundwater interception system pipelines. These should be provided before work is performed in the areas requiring modifications and in the final design documentation.
3. The documents provide no specific plans and specifications for the scope of work to be completed for the East Landfill Pond, including but not limited to pond dewatering, sediment removal and disposition, and confirmation sampling. These should be provided prior to Phase I work and in the final documentation.

**DRAWINGS**

The drawings contain many inconsistencies, omissions, and errors, including but not limited to the following which must be corrected prior to work in the applicable areas:

- **Drawings 51781-007, and -013.** Drawing 51781-007 indicates the location of the approximate limit of impermeable geosynthetics. This is approximately 50 feet down the steep 4H:1V east slope. Drawing 51781-013 indicates a conflicting approximate limit of impermeable geosynthetics at the top of the 4H:1V slope.
- **Drawing 51781-011.** This drawing shows cross sections of the landfill. Section A-A does not indicate the complete top of surface. In addition, the stations (i. e. xx+yy feet) of the sections are not provided.
- **Drawing 51781-018.** This drawing shows the section of the proposed cast-in-place concrete structure for the new seep passive treatment system. Structural details should be provided in the specifications.

**CONSTRUCTION QUALITY ASSURANCE/QUALITY CONTROL (CQA/CQC) PLAN**

1. **Section 3-0, Page 3-1.** This section describes definable features of work (DFW). The section does not identify the work to be performed for the East Landfill Pond in this section, or anywhere else in the document. Because this work has a defined scope and there should be CQA/CQC requirements for confirmation sampling, testing, and hold

points, this section should identify sediment removal from the East Landfill Pond as a DFW. The document should then be revised to include all necessary CQA/CQC requirements for sediment removal, treatment, and placement on the landfill.

2. **Table 4.2, Quality Control Item As-Built Surveys.** This item lists the required as-built surveys. As-built surveys should be required after the completion of the major layers of the cover. These defined breaks should also be designated "Hold Points." For example, as-built surveys should be required at completion of the Cushion Soil layer, at completion of the Biota Barrier layer, and at completion of the Cover Soil layer. Table 4.2 should be revised and the corresponding text in the specifications should also be edited.

Table 4.2, Rock Layer, lists the correct requirement for unconfined compressive strength of 4,000 psi. Specification section 02222, Part 2, Article 2.01, paragraph 3. incorrectly lists 2,000 psi. This should be corrected to 4,000 psi.

## **SPECIFICATIONS**

1. **Section 02221, Part 1, Article 1.02 C.** This article is titled "ROCKY FLATS ALLUVIUM." To be consistent with the other terms in this section, this article should be titled "COVER LAYER SOIL."

"Rocky Flats Alluvium" is the name of the geologic formation and can be interpreted to be all materials from riprap sizes to clay sizes and in any gradation. Identifying the cover soil as a "material that is readily capable of being compacted as an engineered fill material" also can apply to all earth materials. Because the design analysis and placement procedure for the materials for the cover layer soil requires, soil classification, density, and moisture content tests, the COVER LAYER SOIL should be defined in terms of engineering and agricultural characteristics, such as a gradation or other measurable/definable property.

Articles D. and E. of this Part refer to Table A for the gradation of soil for the Foundation layer and the Cushion layer. Table A is not included in this section and should be provided.

2. **Section 02221, Part 3, Article 3.07 Paragraphs 4. and 6.** These paragraphs require the cover soil material to be placed in a single lift to form a uniform 2-foot thick layer at 90 percent standard Proctor dry density. This conflicts with 9 (g) on page 01110-3 which specifies two 12" loose lifts. Experience has shown that it is almost infeasible to obtain the targeted measure of control for a 2-foot thick lift. The text should be corrected for consistency. If a 2' lift is planned, the specification should include a field test to demonstrate the feasibility of this procedure, and also consider placing the cover soil in 2 lifts instead of 1 lift.

As shared with your staff and elaborated on below, Proctor density over 80-85% in the final soil cover will hinder the establishment of vegetative cover.

It is expected that the material properties of the cover soil at the specified compaction density and moisture content will be reflected in the design analysis report.

3. **Section 02221 general; Soil Texture** "Rocky Flats Alluvium" Included in the near surface portions of the materials in this general geomorphic category are layers that have been acted on by soil-forming processes for very long periods. The results of significance to their use in the construction of a growth medium on the landfill sites include some fairly large differences in texture and potentially calcium carbonate

accumulation. The differences in the fine-earth fractions of these materials may vary (in USDA texture terminology) from sandy loam to clay. If clay and heavy clay loam textures comprise the 2 feet of top-most material, the effect on the long-term growth of grasses will be significantly negative primarily because of the low rates of water (and air) infiltration associated with such fine texture. If moisture in natural precipitation does not penetrate the soil, it runs off leaving the plants without sustaining moisture and, of course, when sufficiently concentrated, accelerating erosion on the cap.

Although low infiltration rates are a strong disadvantage to clay-textured material, the moisture-holding capacity that accompanies these materials can be a great advantage if placed correctly in the soil profile. In other words, if paired with a top layer of sufficiently coarse texture to accept the infiltration of rainwater, the presence of clay-textured material in the lower depths can serve as a substantial moisture storage module. Care in assuring that precipitation can be accepted and stored is important in sustaining a vegetative cover.

Calcium carbonate layers in the subsoil of the Rocky Flats material should be monitored. A specification with a limit on calcium carbonate percentage should be included to avoid use of calcareous materials that will seriously restrict plant growth.

Compaction - At this landfill, like many over cap and cover sites, it is apparent that there is a co-occurrence of two approaches to isolating hazardous materials. On the one hand engineers are tasked with creating an impermeable and durable "armor" to keep the hazardous material separated from the human environment. On the other hand, where covers include a surface vegetation component, others are tasked to create a self-sustaining assemblage of plants that are to function in providing cover to prevent erosion. When the armoring structures are not adequately separated by depth from the plant growth medium structures, there is direct conflict as is the case here. Plant roots along with various other soil organisms that are necessary to sustain a plant community over the long term, require both moisture and air. If air and moisture cannot penetrate the "growth medium" no sustaining vegetation cover can be caused to happen. Soils with very high bulk density values (i.e. compacted soils) are perhaps highly desirable from the point of view of creating "armor" but are unacceptable from the point of view of creating a growth medium for plants. Specifications that require compaction of from 90 to 95% of standard Proctor are inconsistent with the goal supporting a sustainable plant community. Growth limiting bulk density varies from about 1.40 gm/cc for heavier soils to about 1.75gm/cc for loamy sand (see Daddow and Warrington 1983). According to Goldsmith et al. (2001), the Proctor densities corresponding to growth limiting bulk density values vary from 81.9% to 91.0 % ( lower for fine texture, higher for coarse textures). It is the opinion of Goldsmith et al. that "compaction between 80 and 85 percent of standard Proctor maximum dry density provides many of the stabilizing benefits of soil compaction without jeopardizing the viability of vegetation development and growth."

The field test specified in comments for specification 02221 should verify the feasibility of this approach for the Rocky Flats Present Landfill site.

4. **Section 02900, Seeding.** Recommended text changes:  
SEED, 2.01. After 2<sup>nd</sup> sentence add -- All seed material provided shall also be free of the following weedy species:

*Agropyron intermedium* Intermediate Wheatgrass (aka *Elymus hispidus*, *Thinopyrum intermedium*, *Elytrigia intermedium*)  
*Agropyron cristatum* Crested Wheatgrass (aka *Agropyron desertorum*)  
*Bromus inermis* var. *inermis* Smooth Brome  
*Bromus riparius* Meadow Brome  
*Festuca arundinacea* Tall Fescue

*Festuca pratensis* Meadow Fescue

2.01A.4. 2<sup>nd</sup> sentence – change to: *This allows ecologists to submit samples of individual species lots to seed testing to ascertain compliance with these specifications.*

2.01 A. This section should be removed from the Products section and placed (with modification) into the Execution section (see 3.03.C. section comments below).

2.02 B should now be 2.03.A. After the first sentence, add: *Native grass hay means hay comprised of native North American grass species, primarily the warm season tall grasses big bluestem (*Andropogon gerardii*), yellow Indiangrass (*Sorghastrum nutans*), and switchgrass (*Panicum virgatum*). The weedy domesticated grasses listed under 2.01 may not be present in the native hay.*

3.02.B. Replace first sentence with: *Tillage may be performed to relieve compaction remaining after soil placement. If, in the judgment of the Site CQA Manager, tillage is not needed, it may be omitted.*

Replace 2<sup>nd</sup> sentence with: *The preferred tillage implement is a chisel. (This common tool has straight shanks that are pulled through the substrate loosening it without pulverizing it). Tillage depth will be 4 to 6 inches unless there is evidence of compaction at greater depth, in which case use of a subsoiler or ripper at greater depth may be needed. Use of disc plows, rotary harrows, or rototilling will not be allowed unless in the judgment of Site CQA Manager it is needed to reduce extremely coarse soil peds. The use of these latter implements typically results in soil pulverization that leads to severely restricted soil surface permeability.*

3.03.B. Replace 2<sup>nd</sup> sentence with: *All seed drilling will be accomplished using a drill specifically made to meter and place native seed mixes. Such a drill will have a seed box for fluffy seed, a seed box for large smooth seed and a seed box for small smooth seeds. In addition, the drill will have double disc furrow openers, depth bands restricting planting depth to (no more than) ½ inch, and 8-inch furrow spacing. In general this type of drill would be known as a "rangeland" drill, but not all rangeland drills will be equipped as specified here. Three point native drills with float control can also be used instead of drills with depth bands to control seeding depth.*

Delete items 1 through 5.

Add: *Drill seeding on slopes less steep than 5(h):1(v) will be accomplished in two passes (with the drill set to one-half the rate shown in the tables). The first pass will be oriented roughly east-west, and the second pass will be oriented roughly north-south. On slopes steeper than 5(h):1(v), drilling will proceed on the contour with the drill set to the full rate shown in the seed mix table. All seeding will precede mulching.*

3.03.C. Change title from "Vegetative Mulching" to Mulching

Delete first paragraph and items 1 and 2. Insert the following mulching specification that was formerly under Section 2 (Products):

*Within 24 hours of seeding, native hay mulch as specified under Products will be applied to the seeded surface. Application will be accomplished using a spreader specifically designed to spread long-strand material from large bales such as a "Haybuster" spreader. Blower-type spreaders that chop the hay into small pieces will not be acceptable. Following application of the hay at the rate of 2 tons per acre, the hay will be crimped into the surface using a flat-disc implement specifically made for that purpose. Following crimping, guara-based tackifier will be applied at the rate of 100 lb/ac.*

Erosion control blankets and bonded fiber matrix mulches (e.g. "Soil Guard") may not be necessary here. Slopes no steeper than 3(h):1(v) are accessible to hay spreaders and tackifier application. Bonded fiber matrix can be peeled off the surfaces of reclamation sites in high winds too, so there is no net advantage to their great expense, and the slopes are not steep enough to necessitate their use either. Erosion control blanket will require careful placement and anchoring to avoid wind damage also. Again, the slope steepness and threat of erosion do not seem great enough to necessitate its use in general. Localized high runoff areas (e.g. drainage ditches) may justify the use of erosion control blankets for those special areas, such as the drains around the edge of the landfill..

If the crimped and tackified native hay will not hold up to winter winds at certain locations, it may be necessary to use well-anchored erosion control blanket. Native hay mulch at one ton per acre overlain by anchored jute netting would be my choice where it has been demonstrated to be necessary.

3.04 The side drainages included in this design may need extra control, such as use of an erosion control blanket.

#### Attachment: Seed Mix

Greatly reduce or delete sand dropseed; the soils of the site are not particularly sandy and it is poorly suited to loam and finer textures. To have it as the main component (30%) of the mix does not make sense.

Side oats grama, blue grama, and buffalograss are all good species. Junegrass and Canby bluegrass are native species, however they don't have a positive track record in seedings. To have one-quarter of the mix in these under-performers is not advisable.

The following mix is representative of the area and will achieve the goal of cover stabilization much better. Note that this is not a mix directed toward reestablishment of original Rocky Flats Bluestem Grassland. But it does acknowledge that several of the important species in that vegetation are well-adapted tools for the purpose of landfill cover stabilization and erosion control. It also includes some cool season native species that are comparatively quick to establish and some that possess rhizomes (i.e. are "turf-formers"), allowing much better erosion control.

Species	Common Name - Variety	Sd/sq ft*	% PLS <sup>1</sup>	lb/ac
Andropogon gerardii	Big bluestem - Champ	2	5.6	0.7
Andropogon gerardii	Big bluestem - Kaw	2	5.6	0.7
Bouteloua curtipendula	Sideoats grama - Vaughn	2	5.6	0.5
Buchloe dactyloides	Buffalograss - Cody	3	8.3	2.3
Buchloe dactyloides	Buffalograss - Native**	1	2.8	0.8
Chondrosum gracile	Blue grama - Bad River	4	11.1	0.2
Elymus lanceolatus var. psammophilus	Streambank wheatgrass - Sodar	5	13.9	1.4
Elymus lanceolatus var. lanceolatus	Thickspike wheatgrass-Critana	5	13.9	1.4
Koeleria pyramidalis	Prairie Junegrass - Native**	1	2.8	0.2
Elymus trachycaulus	Slender wheatgrass - San Luis	3	8.3	0.8
Pascopyrum smithii	Western wheatgrass - Arriba	3	8.3	1.2
Poa canbyi (P. secunda)	Canby bluegrass - Canbar	1	2.8	0.05
Sorghastrum nutans	Yellow Indiangrass - Holt	2	5.6	0.5
Stipa viridula	Green needlegrass - LoDom	2	5.6	0.5
TOTAL		36***	100	11.25***

- \* Seeds per square foot for drill seeding
- \*\* Native = source in central Great Plains
- \*\*\* 36 seeds per square foot, when drilled with a drill with 8-inch furrow spacing results in an average of two seeds per lineal inch of drill furrow.
- † PLS = pure live seed

### General Comments

It is important to plant seed of controlled quality. The extra step of having the individual lots of seed, that have been provided from a Contractor, tested for the presence of weeds is worthwhile. It is equally worthwhile to assure that weeds do not enter the project site via mulch materials.

In addition to the seeds above, certain species of native grasses and forbs from immediately adjacent native grasslands have been collected by volunteers and provided to DOE/Kaiser Hill. These plants represent local genomes (genetic races) that may have superior adaptation to the site. Their addition to the general seed mix during seeding operations will allow those local ecotypes the chance to establish in the revegetation area. If truly superior to the commercial varieties in the main mix, they may slowly increase over time, improving the long term vigor and effectiveness of the landfill vegetation cover.

Seeding times are addressed in the Kaiser Hill draft, and to the extent that it may be of interest, the following comments are provided. In general, warm season species will germinate and establish best if seeded in late May/ June. In general, cool season species will do best if seeded in the period of fall (after Oct. 15) through early spring (end of March) if soil conditions allow. If use of these optimal windows of seeding is sought, the timing of topsoil placement and seedbed preparation will need to be considered. The use of temporary cover crops could also be considered, but in general, direct planting of the permanent seed mix after topsoiling and seedbed preparation followed immediately by mulch placement will be preferred. USF&WS advises that if there will only be one seeding effort, with no supplemental irrigation; generally late fall (Nov-Dec) works best.

The bottoms of drains around the edge of the landfill may necessitate the use of erosion control blankets. In areas of low gradient, these drainage bottom areas may ultimately be wetland sites and the incorporation of a special seed mix for the drainage bottoms may be appropriate.

Vegetation performance criteria which reflect section 5.1 of the IM/IRA should be included in the specifications. They should provide for compliance with the Noxious Weed Act and describe what measure of success is targeted in the short-term.

## ATTACHMENT 2

### Present Landfill Accelerated Action Project Rocky Flats Environmental Technology Site

REFERENCE: ATTACHMENT 1 (drawing showing east/west construction boundary)

#### CONSTRUCTION ACTIVITIES INCLUDED IN WESTERN PORTION OF SITE (WORK WEST OF CONTOUR 5980 AND NORTH AND SOUTH OF BOUNDARY) (INCLUDED IN REGULATORY AGENCY APPROVAL)

- ✓ 1. All mobilization activities, including soil test cell
- ✓ 2. Clearing & Grubbing
- ✓ 3. Pre-grading (cut & fill)
- ✓ 4. Cushion Layer Installation
- ✓ 5. Geosynthetic Layer Installation, including anchor trench
- ✓ 6. Cushion and Rock Layer Installation
- 7. Soil Cover Installation — *pending a new spec.*
- ✓ 8. Perimeter Ditch Installation
- ✓ 9. Barometric Vent System west of surface contour 5980

#### CONSTRUCTION ACTIVITIES INCLUDED IN EASTERN PORTION OF SITE (INCLUDED IN REGULATORY AGENCY APPROVAL)

- ✓ 1. Clearing of the surface in the eastern portion of the site
- ✓ 2. Removal of the cattails and vegetation in the East Landfill Pond
- ✓ 3. Geotechnical borings on the east slope of the Present Landfill
- ✓ 4. Access platforms/roads to conduct the geotechnical borings on the east slope
- ✓ 5. Pumping of treated seep water to temporary storage tanks and subsequent transfer to A-series ponds

#### CONSTRUCTION ACTIVITIES INCLUDED IN EASTERN PORTION OF SITE (WORK EAST OF CONTOUR 5980 AND INSIDE THE BOUNDARY ON DRAWING) (NOT INCLUDED IN THE REGULATORY AGENCIES APPROVAL)

- 1. Grubbing
- 2. Pre-grading (cut & fill)
- 3. Cushion Layer Installation
- 4. Geosynthetic Layer Installation, including anchor trenches
- 5. Cushion and Rock Layers Installation
- 6. Soil Cover Installation
- 7. Barometric Vent System east of surface contour 5980
- 8. Removal and solidification of sediment from East Landfill Pond
- 9. Placement of sediments under the landfill cover (as shown on drawing)
- 10. Confirmation sampling at East Landfill Pond after sediment removal
- 11. Construction work on the existing east slope of the Present Landfill (as currently designed)
- 12. Seep Treatment System modifications and GWIS piping modifications